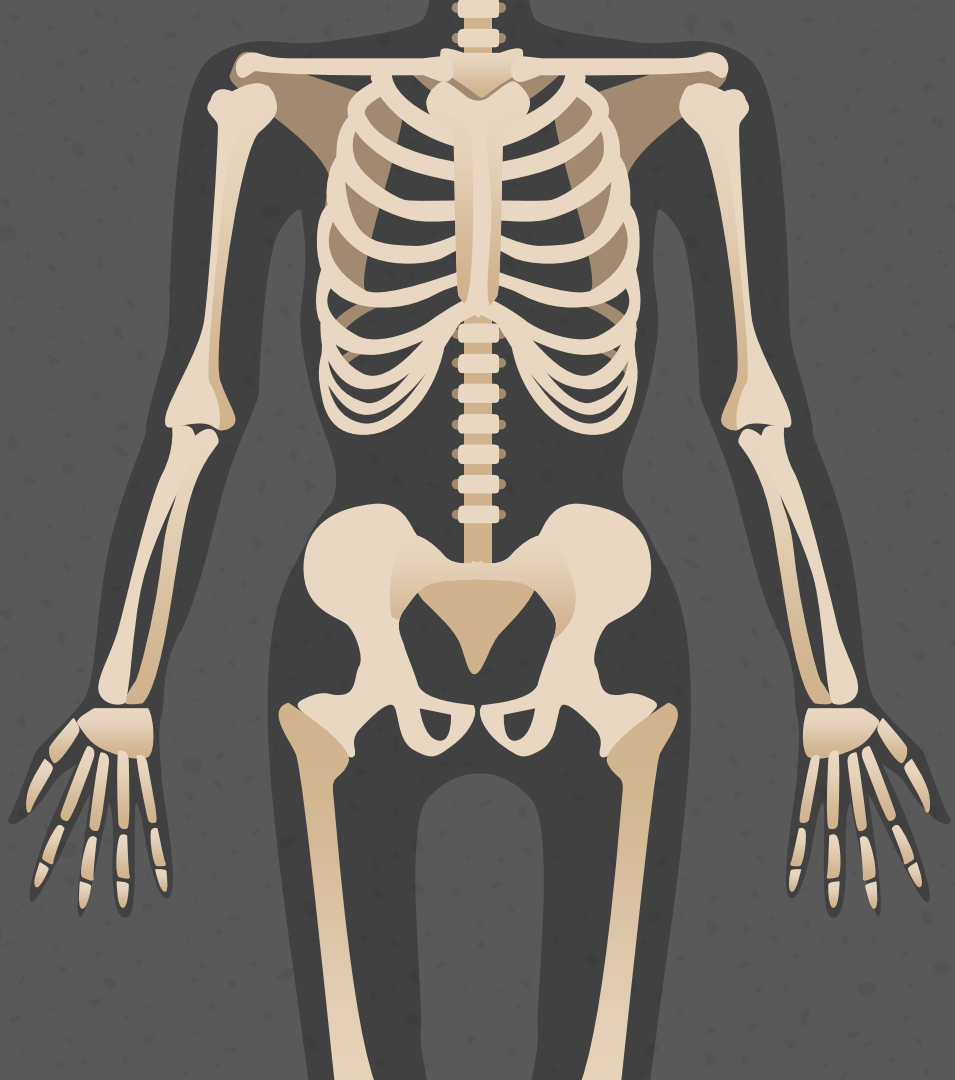
UNIT 7.4

Moving the Body

(Page 252-259)



Key Words

01. Antagonistic muscles

Antagonistic muscles are **those muscles which produce movements in an antagonistic pair of muscles by opposing the movement of the agonistic muscle** . when one contacts the other relaxes and vice versa.

Example- biceps and triceps

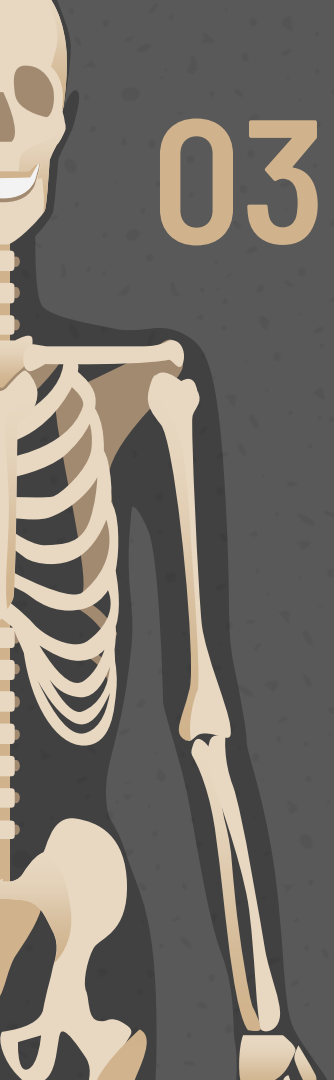
(Page 252)

Key Words

02. Ball-and-socket joints

A joint in which the rounded surface of a bone moves within a depression on another bone, allowing greater freedom of movement than any other kind of joint.

(Page 252)

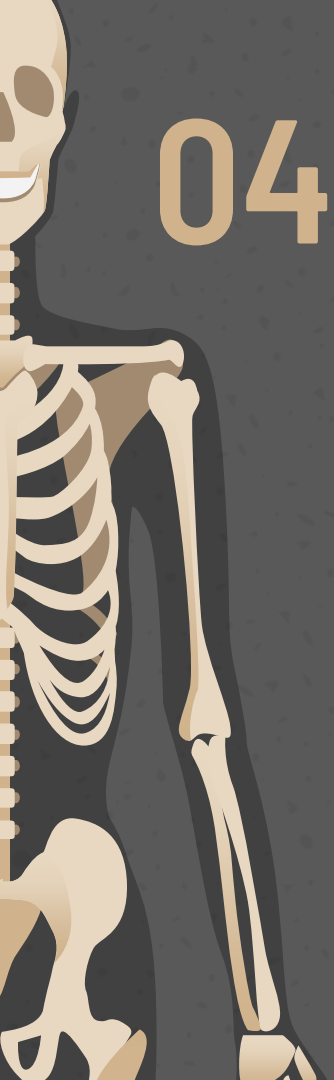


Key Words

03. Biceps

A muscle on the front part of the upper arm.

(Page 252)



Key Words

04. Contraction

The tightening, shortening or lengthening of muscles when you do some activity.

(Page 252)

Key Words

05. Exoskeleton

Is the external skeleton that support and protects an animal’s body, in contrast to the internal skeleton.

(Page 252)

Key Words

06. Hinge Joints

A type of joint that functions much like the hinge on a door, allowing bones to move in one direction back and forth with limited motion along other planes.

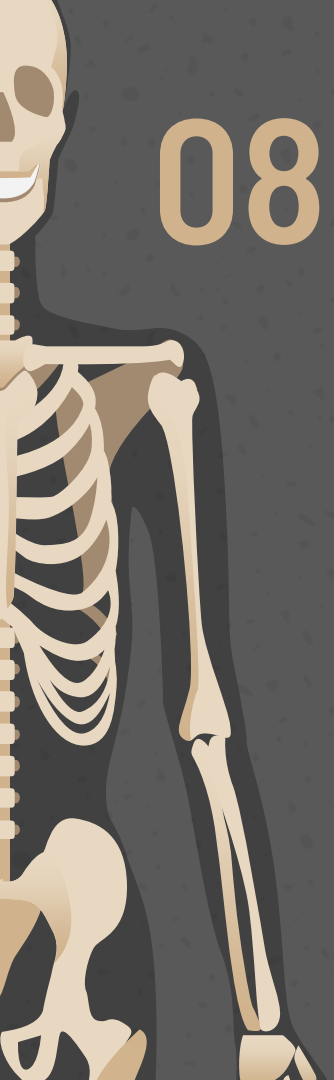
(Page 252)

Key Words

07. Joints

A structure that separates two or more adjacent elements of the skeletal system.

(Page 252)



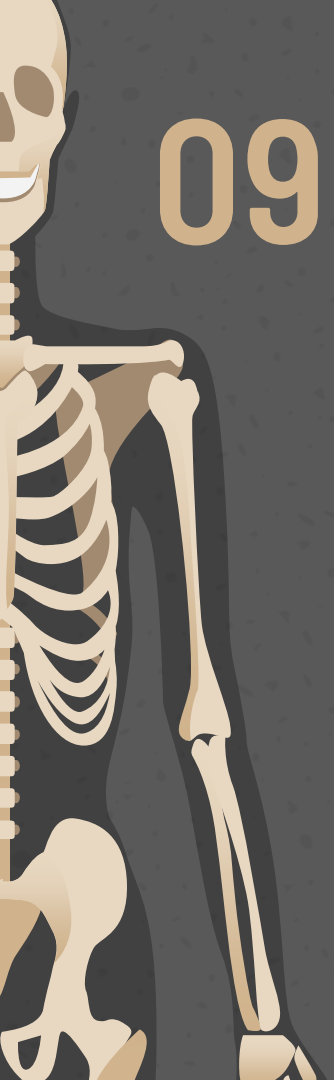
Key Words

08. Muscles

Are soft tissues. Many stretchy fibers make up your muscles.

(Page 252)

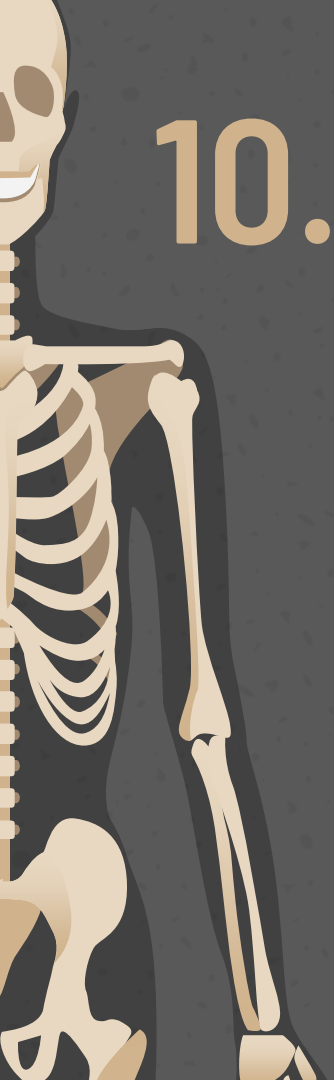
Key Words



09. Skeleton

The internal bones serve as a framework for the body.

(Page 252)



Key Words

10. Tendons

Is a cord of strong, flexible tissue, similar to a rope. It connects your muscles to your bones.

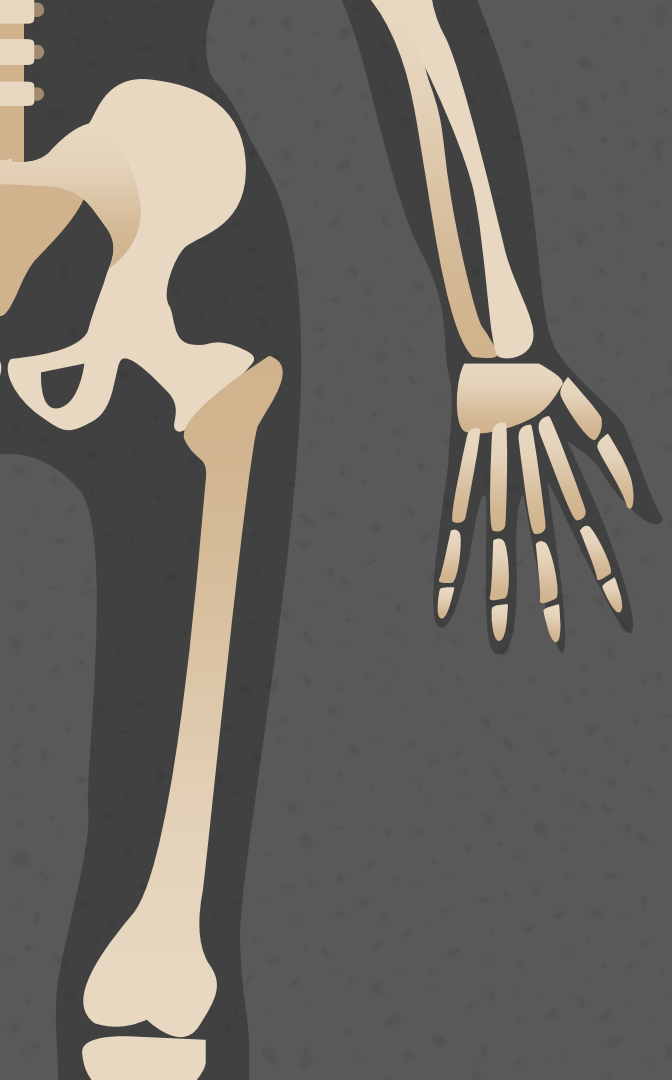
(Page 252)

Key Words

11. Triceps

A large, thick muscle on the dorsal part of the upper arm.

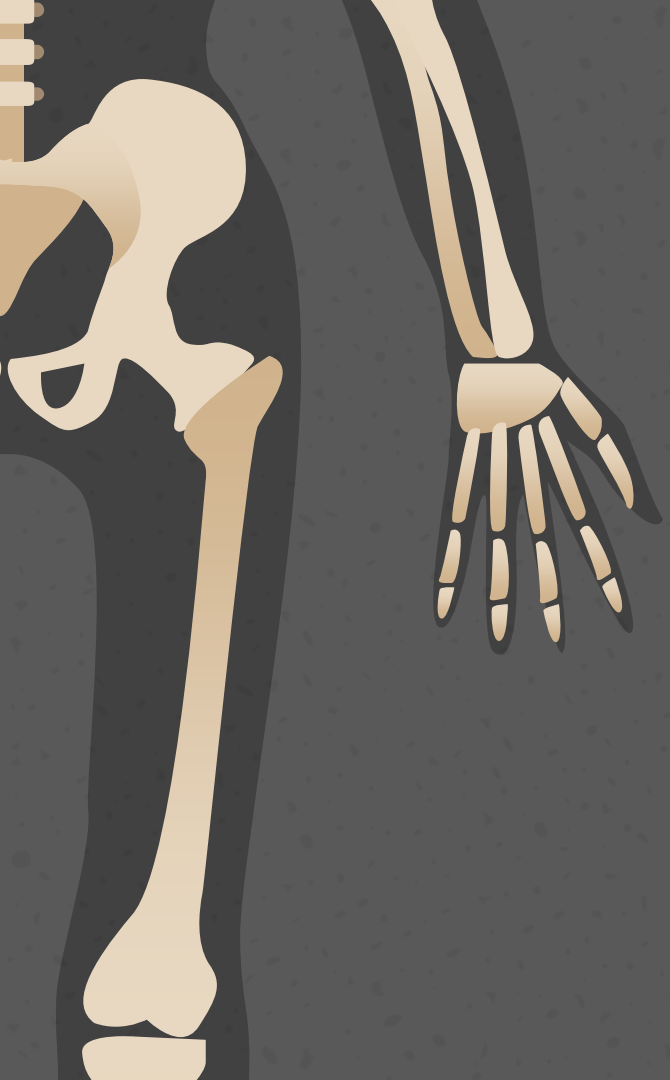
(Page 252)



The Skeleton

Animals' bodies are supported by a **skeleton.** Insects and other arthropods have a skeleton on the outside of their body.

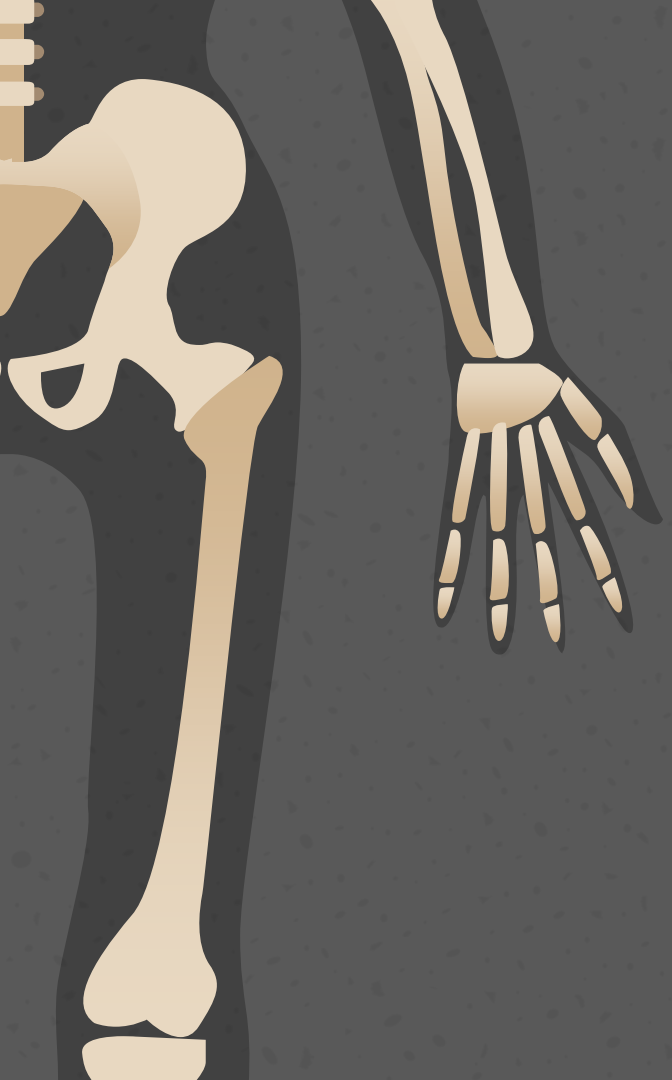
(Page 253)



The Skeleton

This is called an **exoskeleton.**

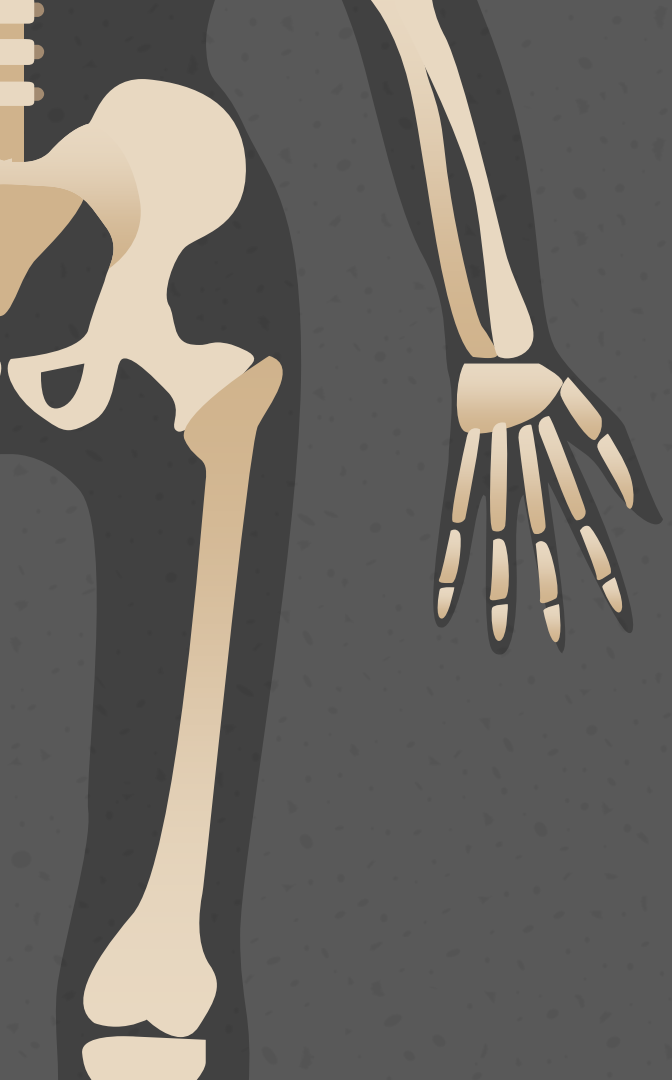
(Page 253)



The Skeleton

Your skeleton is inside your body. It is made of bones. You do not need to remember the names of all of these bones, but you may know some of them already.

(Page 253)



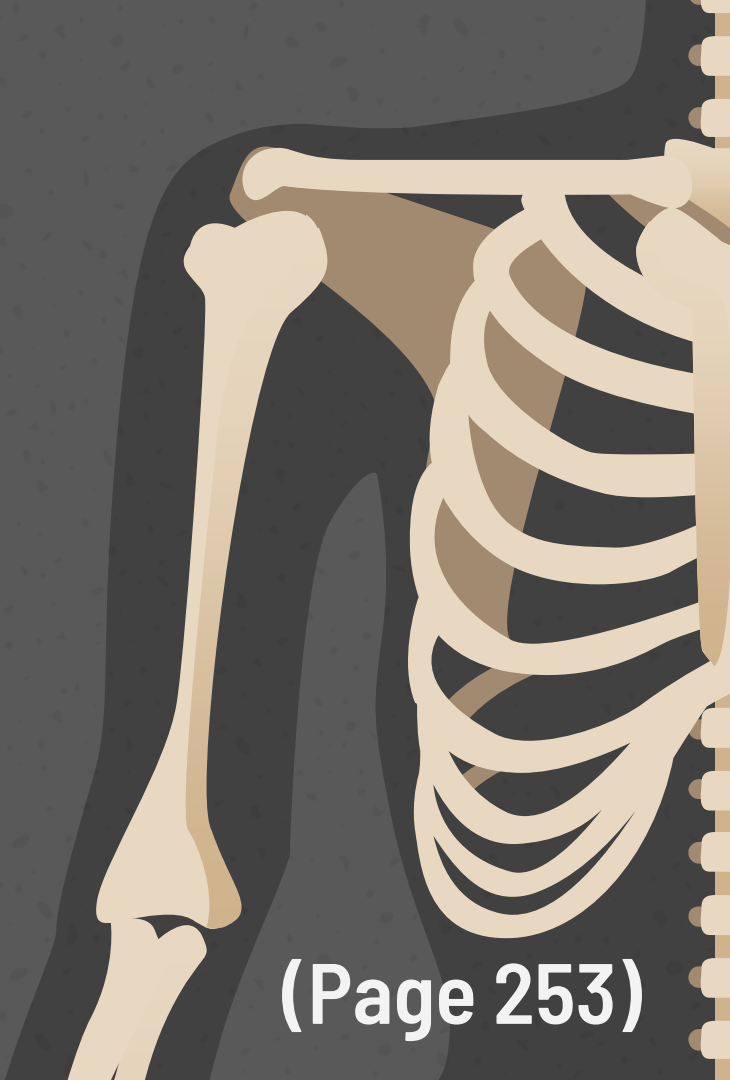
The Skeleton

Bones are hard and strong. They contain a lot of calcium. If you do not have enough calcium in your diet, your bones may not grow properly. Bones contain living cells, so you also need protein in your diet to build strong bones.

(Page 253)

Joints

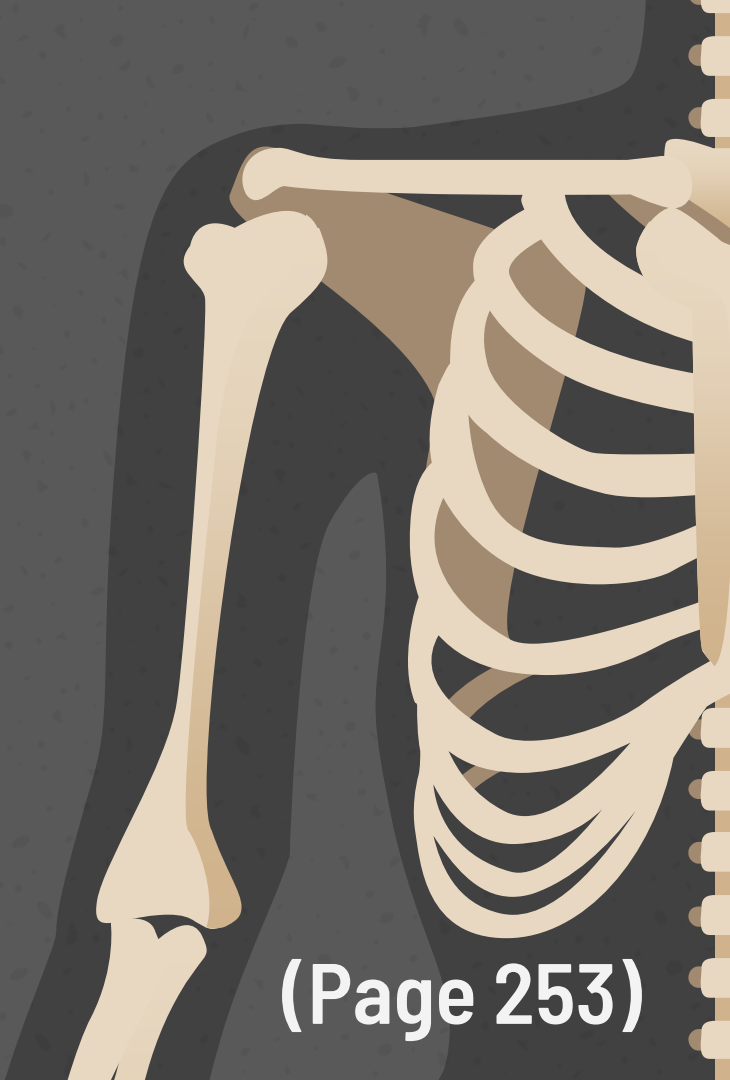
Bones cannot bend. Movement in the skeleton can only take place where two bones meet one another. These places are called **joints**.



(Page 253)

Joints

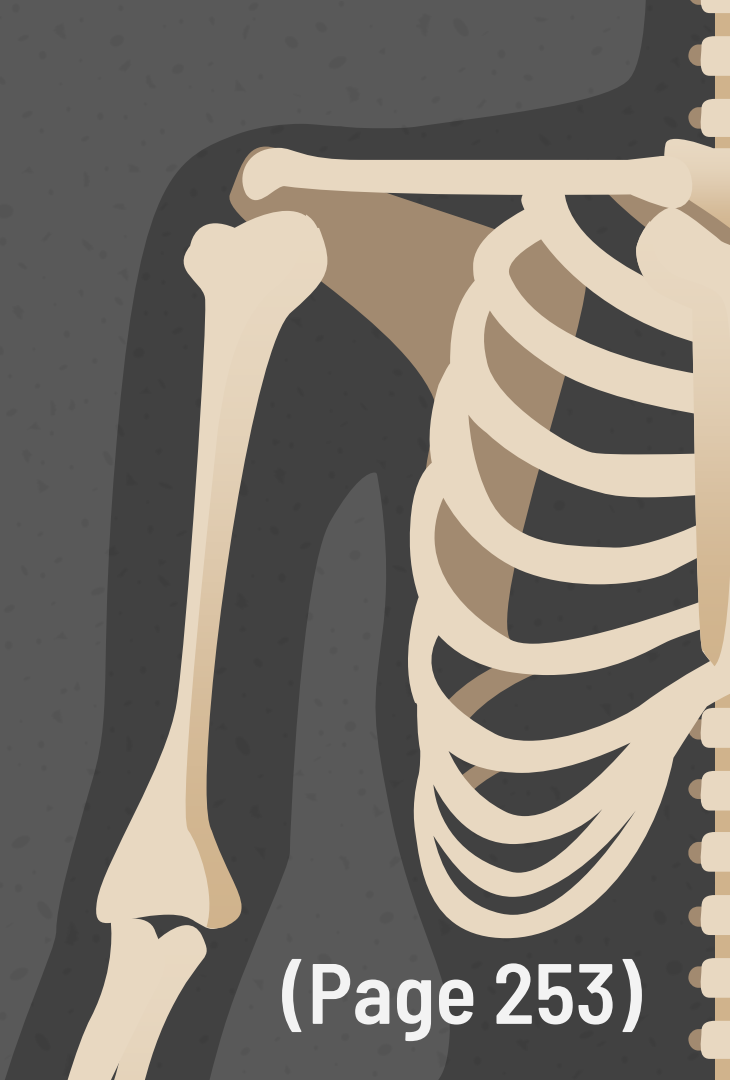
Some joints work like the hinges on a door. They let the bones move back and forth in one direction, in the same way that a door opens and closes. These are called **hinge joints.**



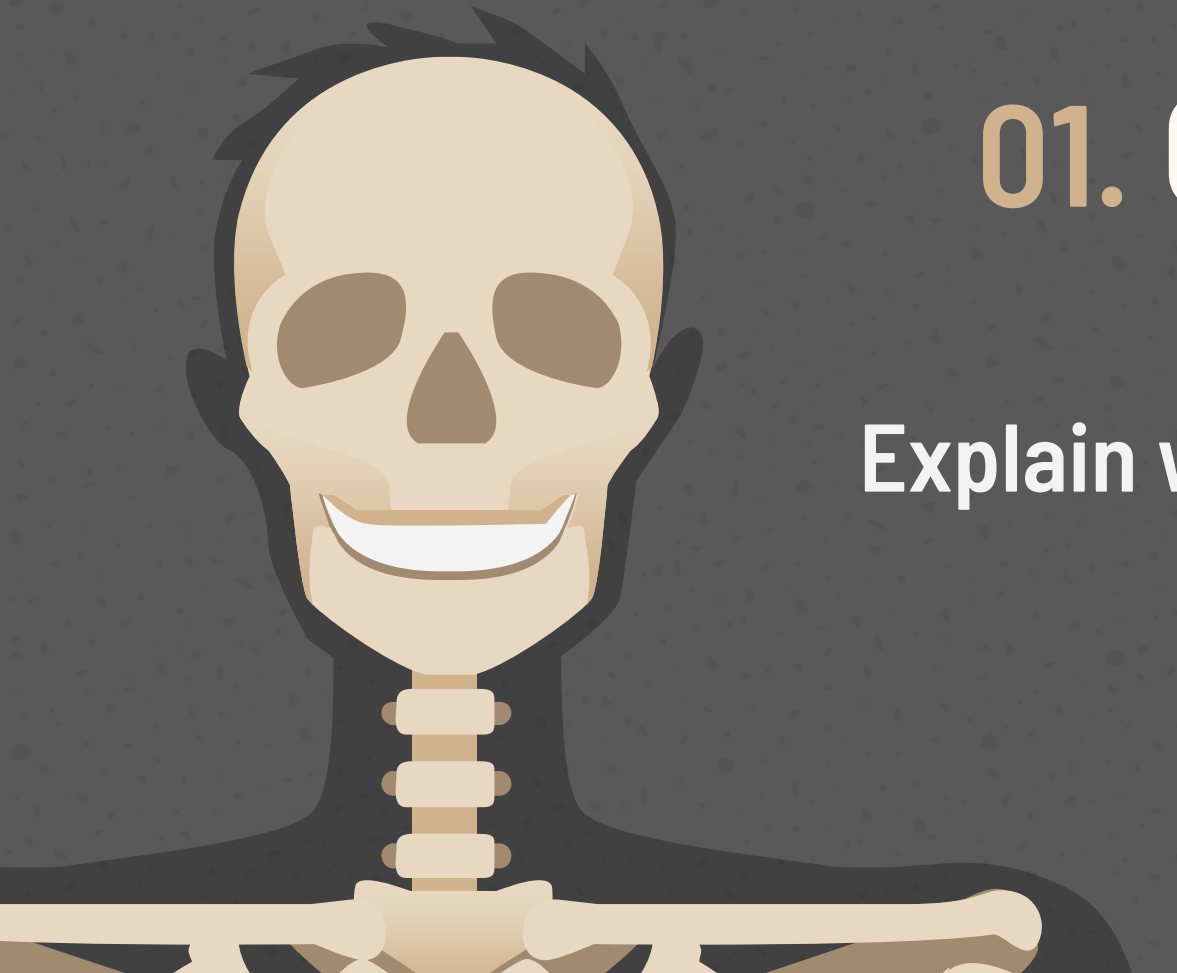
(Page 253)

Joints

Some joints let the bones move in a complete circle. At these joints, one of the bones has an end shaped like a ball. The other bone has a cup, or socket, that the ball fits into. These are called **ball-and-socket joints.**



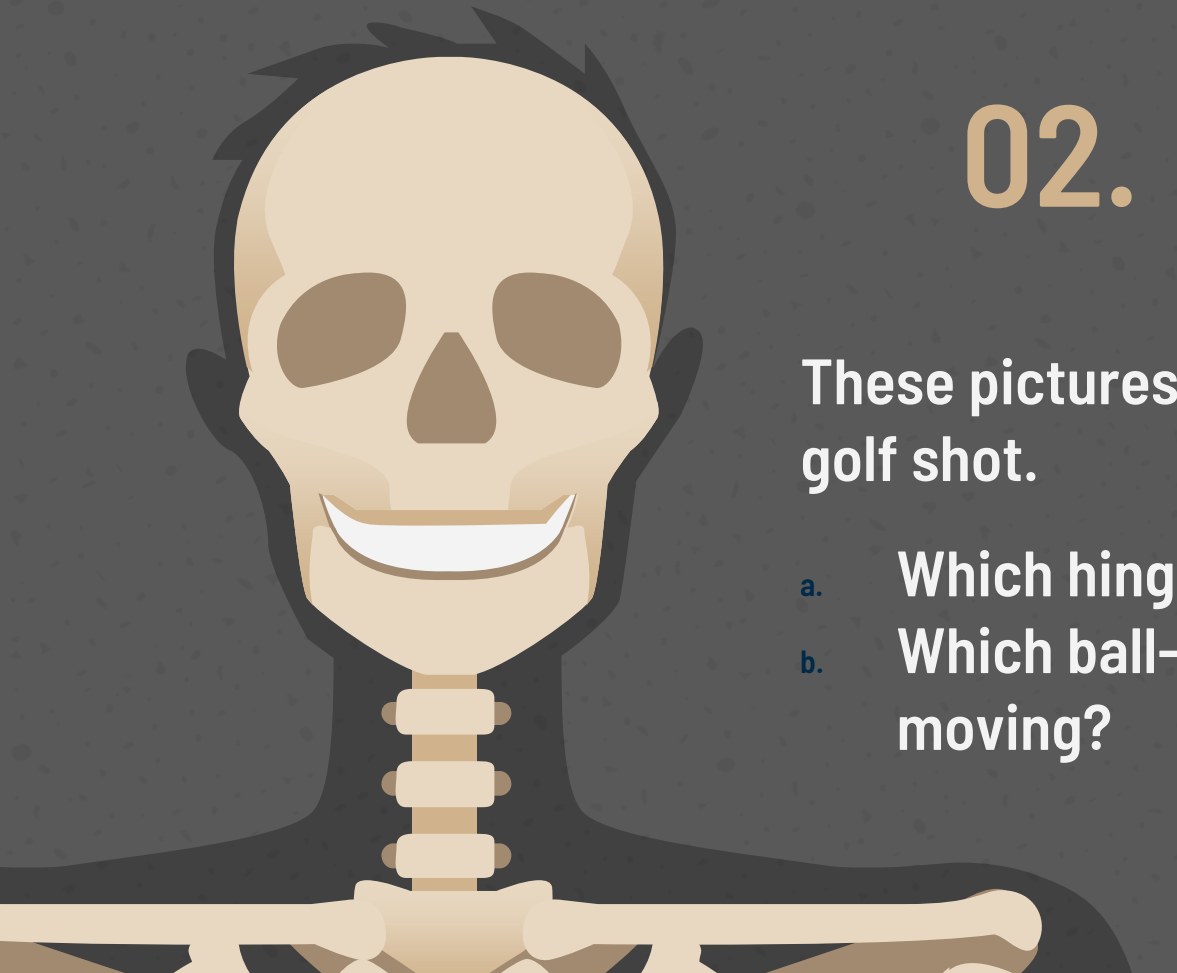
(Page 253)



01. Question

Explain what a joint is.

(Page 254)

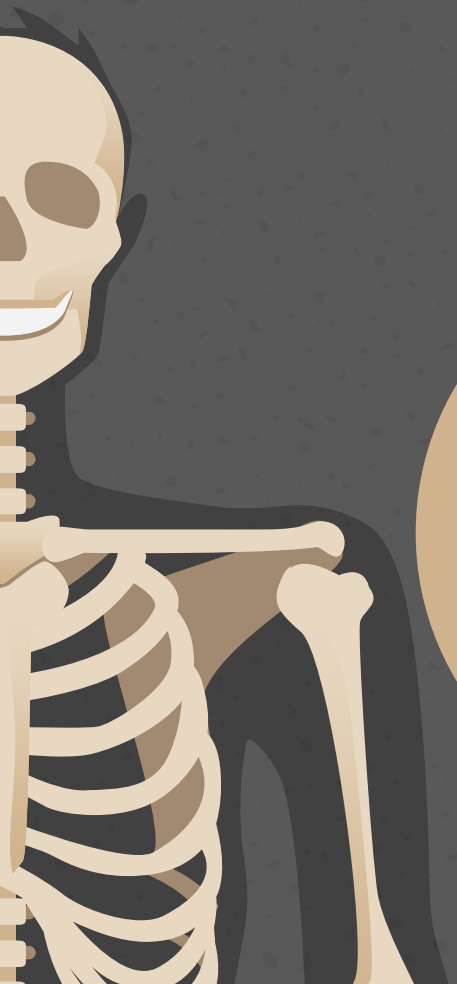


02. Question

These pictures show a man hitting a golf shot.

a. Which hinge joints is he moving?
b. Which ball-and-socket joints is he moving?

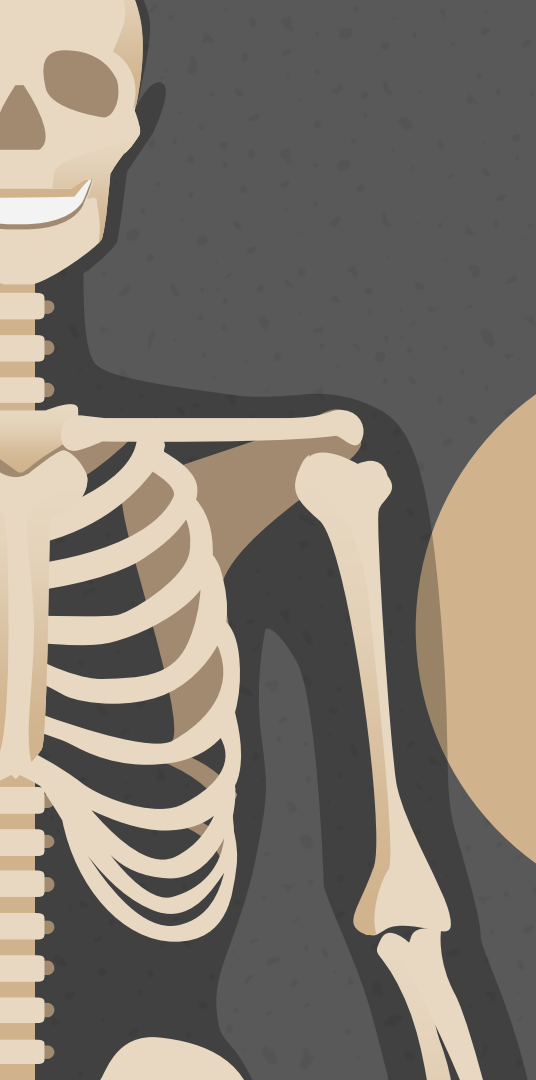
(Page 254)



Joints in the Arm

You have several different joints in your arms. These include the shoulder joint, the elbow joint, the wrist joint and all the joints in the fingers.

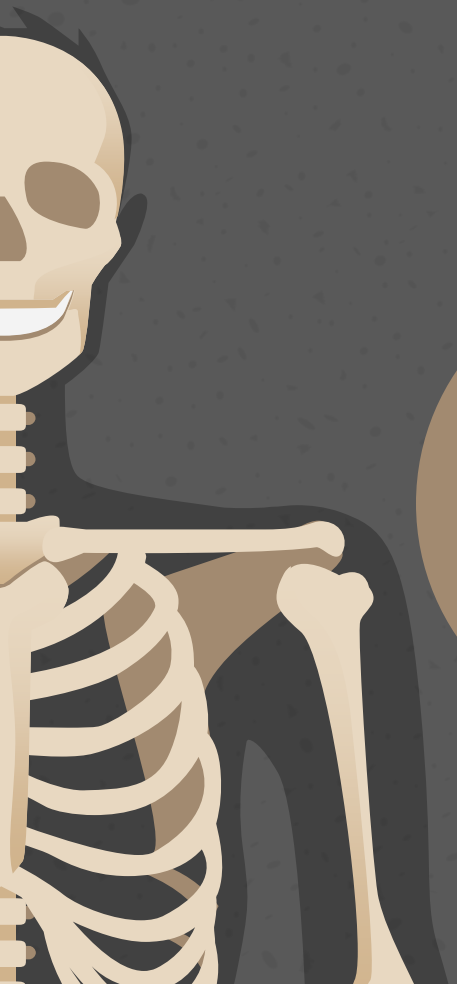
(Page 254)



Joints in the Arm

The photo is an X-ray of someone's arm. Can you pick out the humerus, radius and ulna? You should also be able to find the hinge joint at the elbow, and the ball-and-socket joint at the shoulder.

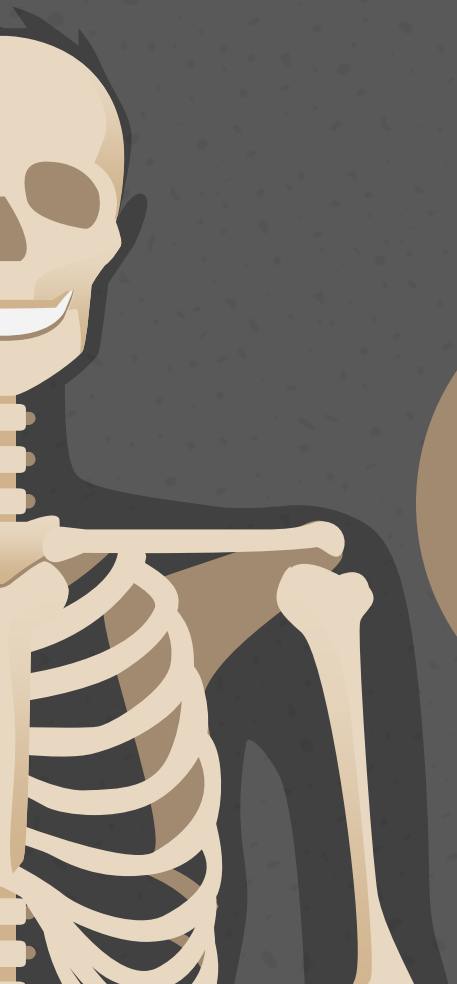
(Page 254)



Muscles

Bones and joints cannot move themselves. You use **muscles** to move bones at joints.

(Page 255)



Muscles

Muscles are made of specialized cells. These cells are able to make themselves shorter. This is called **contraction.**

(Page 255)

Muscles

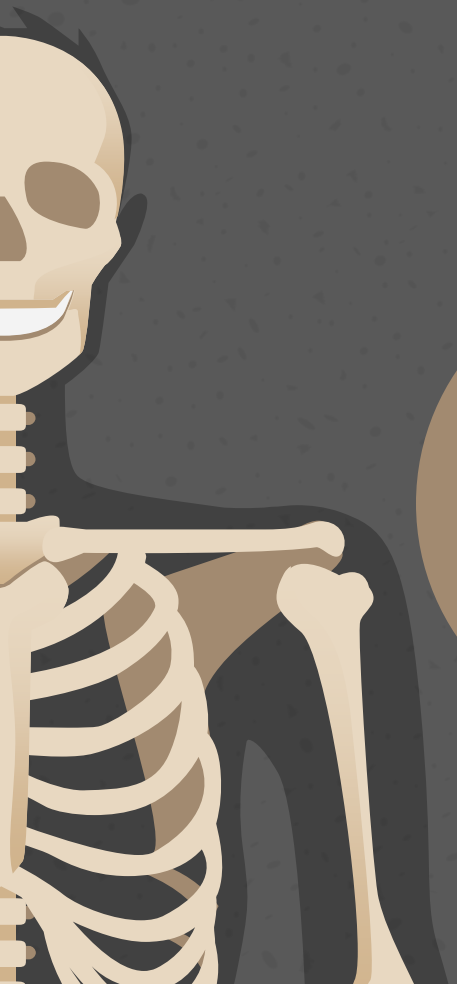
Muscles use energy to contract. Like all cells, they get this energy from nutrients, especially glucose. The energy is released from glucose by respiration. The more you ask your muscles to contract, the more energy they use, and therefore the more glucose they use.

(Page 255)

Muscles

Muscles can produce a strong pulling force when they contract. Many of your muscles are attached to bones, by tough cords called **tendons.** When the muscle contracts, it pulls on the tendon, which pulls on the bone. This makes the bone move at a joint.

(Page 255)



Muscles

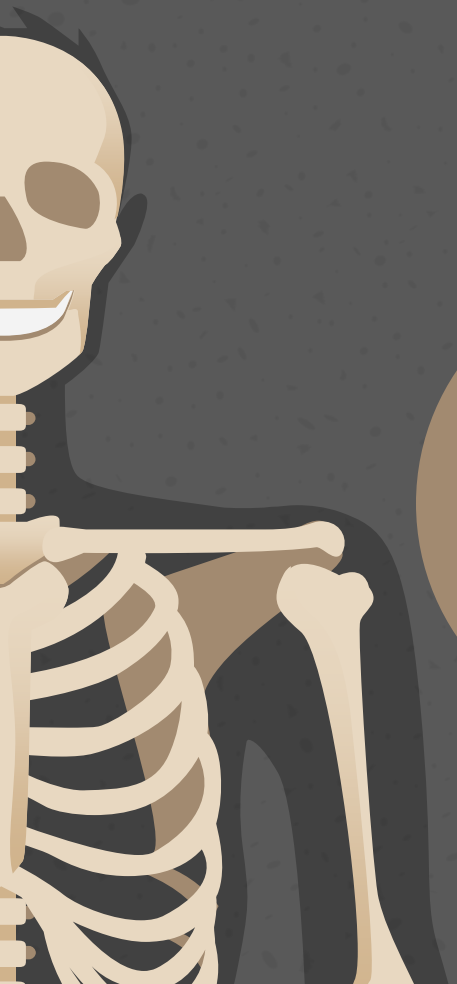
This diagram shows the muscles that move the arm bones at the elbow joint.

(Page 255)

Muscles

First, loot at the biggest muscle in the diagram. This is the **biceps.** (Biceps is an unusual word, because it ends in an s even though it is regular. One biceps, two biceps.) ‘Bi-’ means two. This muscle is called the biceps because it has two tendons that attach it to the scapula.

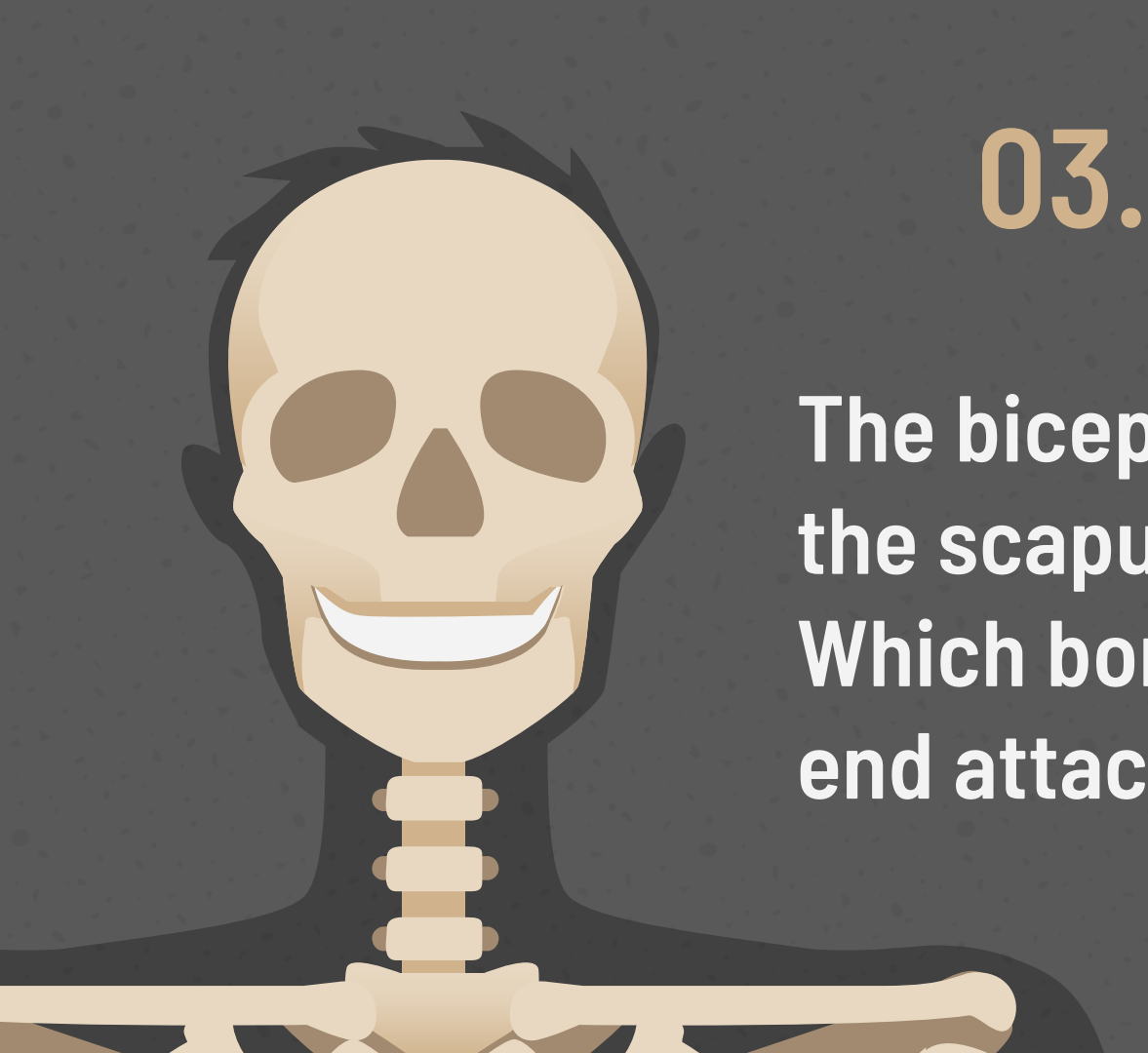
(Page 255)



Muscles

The longer, thinner muscle in the diagram is the **triceps.**

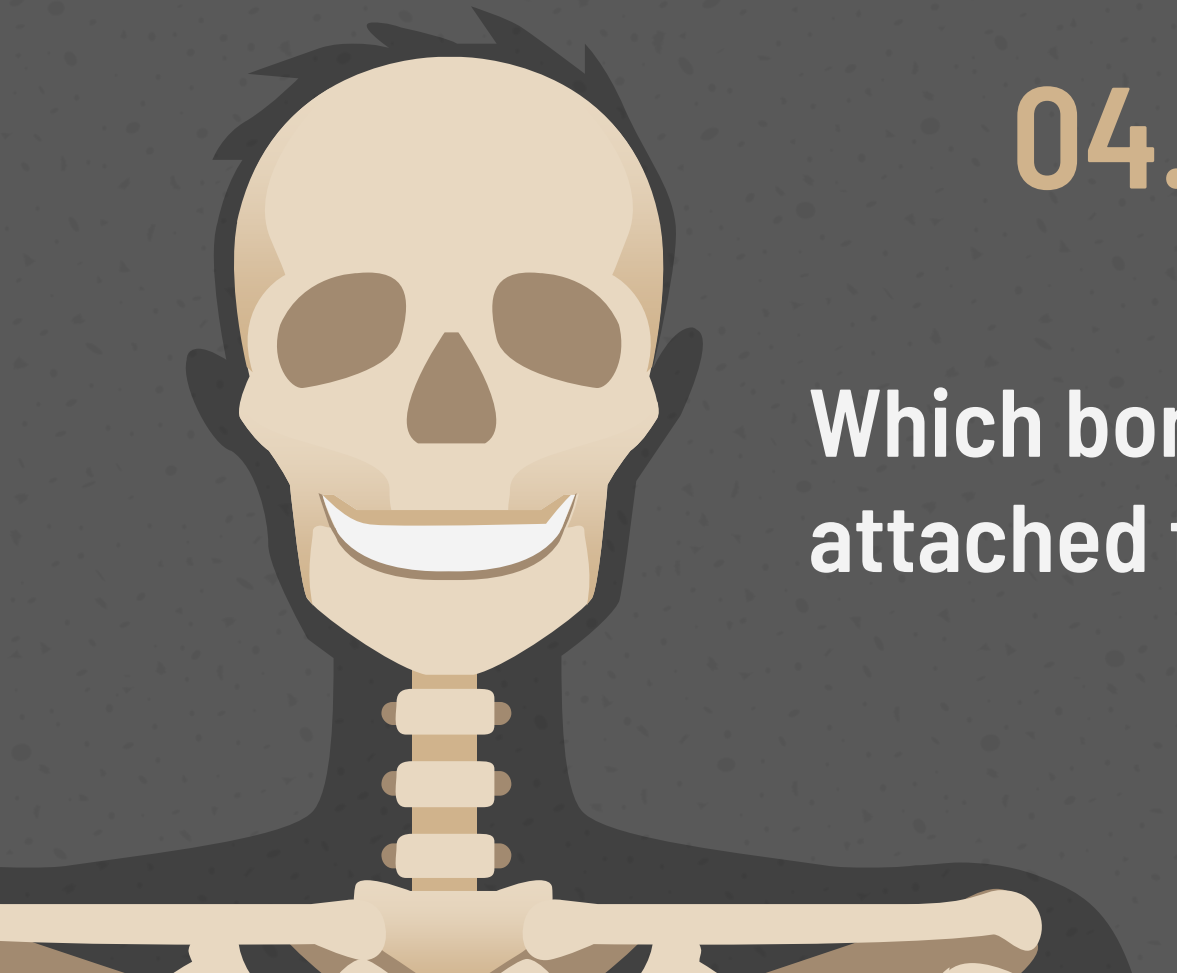
(Page 255)



03. Question

The biceps is attached to the scapula at one end. Which bone is the other end attached to?

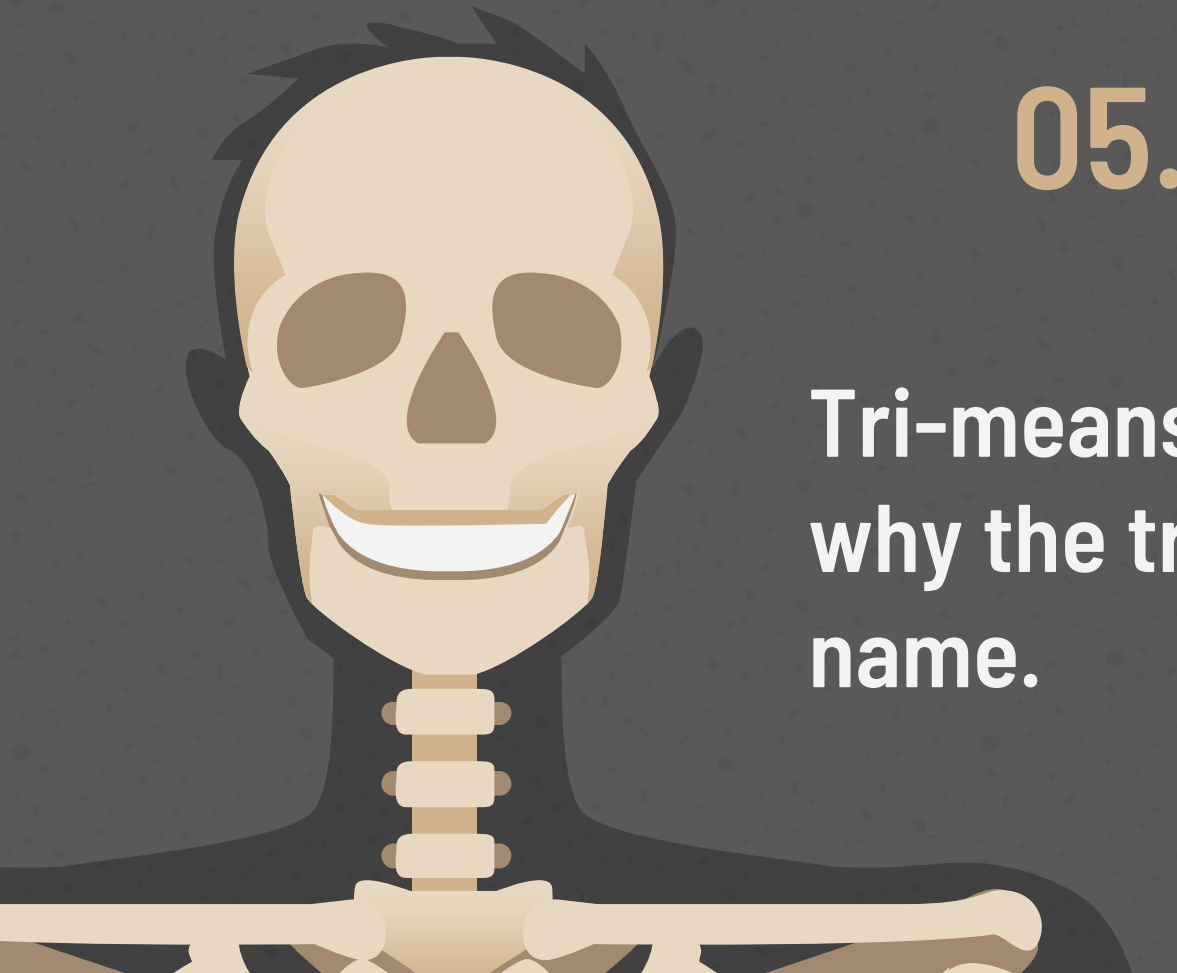
(Page 255)



04. Question

Which bones is the triceps attached to?

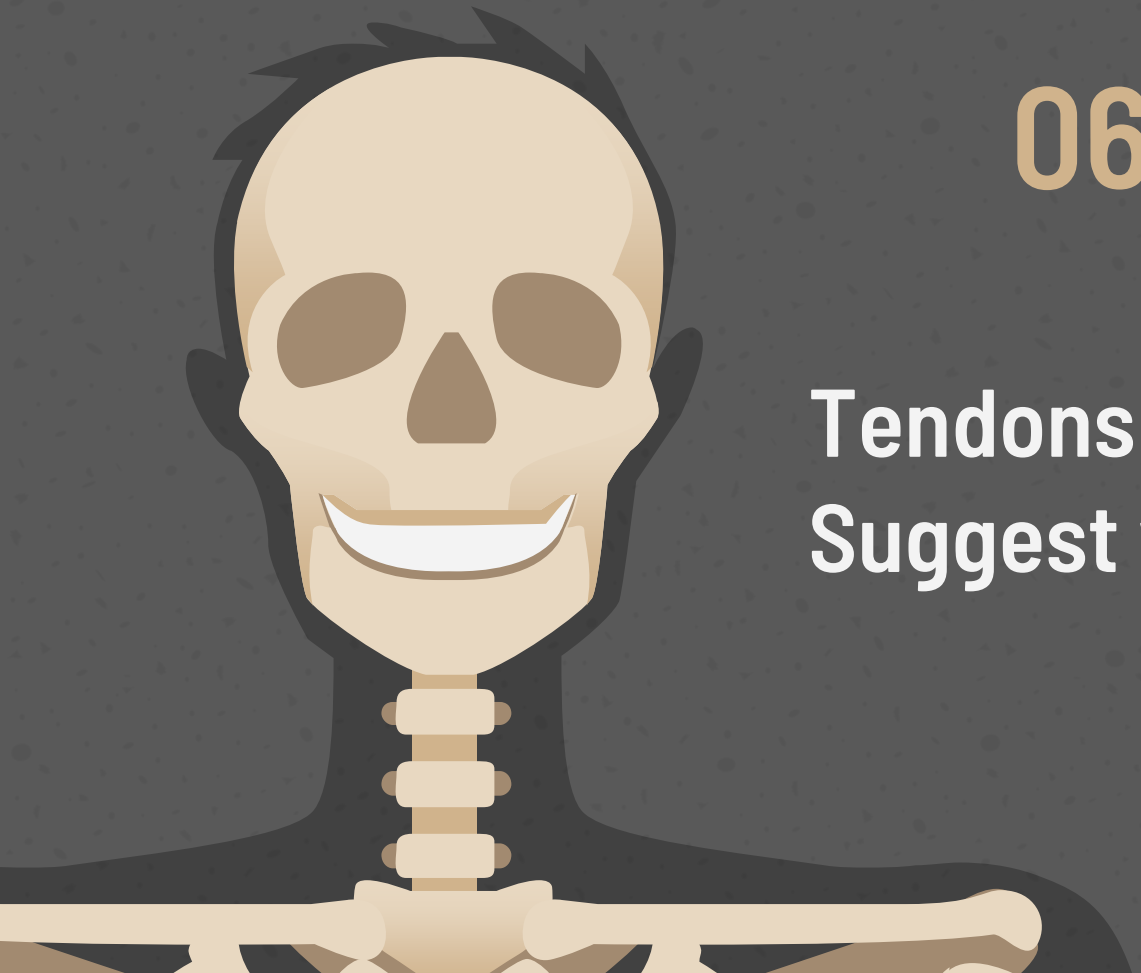
(Page 255)



05. Question

Tri-means three. Suggest why the triceps has this name.

(Page 255)

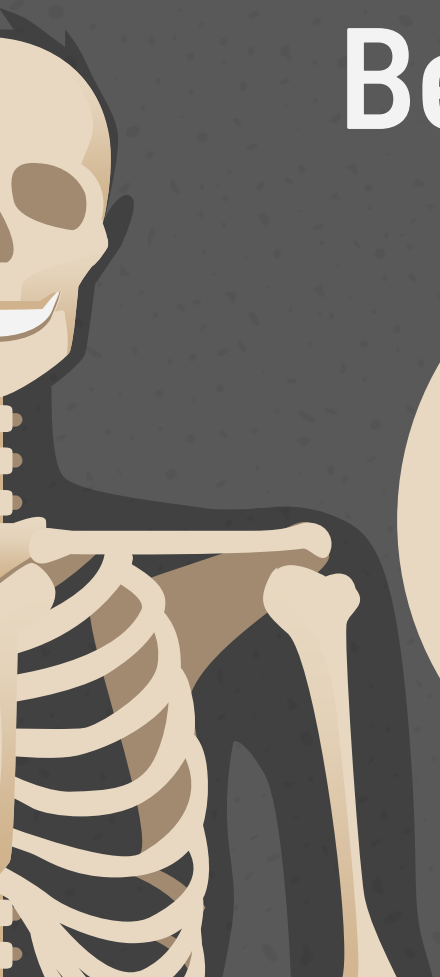


06. Question

Tendons do not stretch.
Suggest why not.

(Page 255)

Bending the Elbow Joint

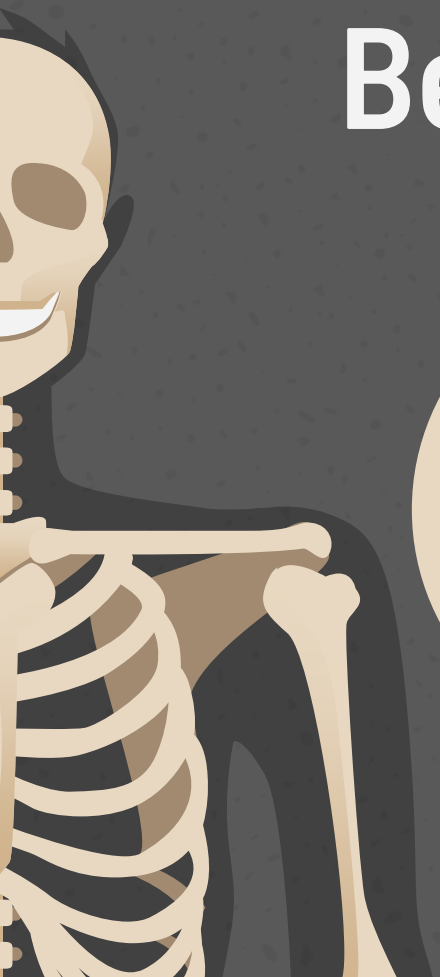


Think about what happens when you bend your arm at the elbow.

When you decide to bend your arm, your brain sends an electrical impulse along a neurone, to your biceps muscle.

(Page 256)

Bending the Elbow Joint



The cells in the biceps muscle respond to this electrical impulse by contracting. This makes the whole muscle get shorter.

(Page 256)

Bending the Elbow Joint

The biceps muscle is firmly fixed to the scapula at one end and the radius at the other end. So, when it gets shorter, these bones are pulled closer together. The elbow bends, as shown in the diagram.

(Page 256)

Straightening the Elbow Joint

Now think about how you straighten your arm at the elbow joint.

It's important to remember that muscle can only pull. They cannot push. Muscles can generate a force by getting shorter, or contracting. But they cannot generate a force by getting longer.

Straightening the Elbow Joint

So, the biceps cannot push the arm straight again. You need another muscle to *pull* the arm straight.

The muscle that does this is the triceps muscle. This diagram shows how it does this.

(Page 256)

Straightening the Elbow Joint

When a muscle is not contracting, it relaxes. This is all that muscles can do – they can either contract or relax.

Antagonistic Muscles

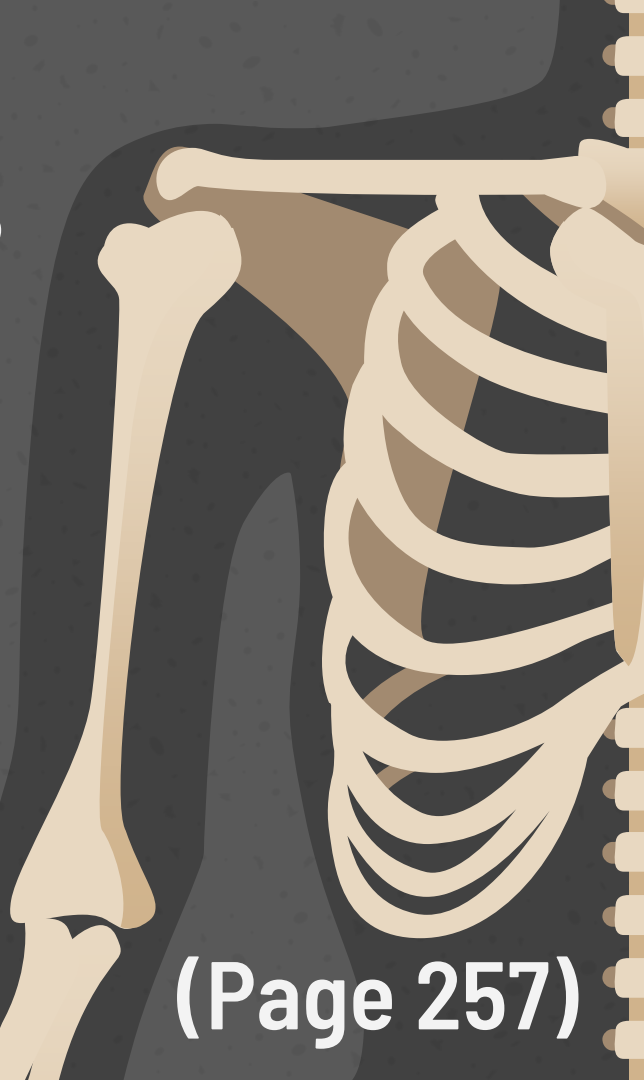
You can see that the biceps muscle and the triceps muscle work as a team.

- To bend the arm, the biceps contracts an the triceps relaxes.
- To straighten the arm, the triceps contracts and the biceps relaxes.

(Page 257)

Antagonistic Muscles

Two muscles that work together like this are called **antagonistic muscles.** When one of them contracts, it moves the bones at a joint in one direction. When the other muscle contracts, it moves the bones in the other direction.



(Page 257)